



PRESS RELEASE

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## SUPERGRID INSTITUTE INAUGURATES ITS HIGH POWER SOURCE TEST PLATFORM – THE FIRST OF ITS KIND IN EUROPE

Located in Villeurbanne (Lyon, France), this test platform will be inaugurated in an official ceremony on Tuesday the 28<sup>th</sup> of March.

Since its creation in 2014, the Institute for Energy Transition (ITE) SuperGrid Institute has continually developed and asserted its position as a European leader in high and medium voltage direct current technologies. These technologies are essential for the development of future energy networks. The institute further reinforced its position in the summer of 2022 with the commissioning of a new test platform.



View of the platform from the outside.

### THE HIGH POWER SOURCE FACILITY: AN ESSENTIAL TEST PLATFORM FOR DEVELOPING AND SECURING THE ELECTRICITY NETWORK OF TOMORROW

This new platform, the first of its kind in Europe, was developed to support industrial players' development of new high voltage technologies for the massive integration of renewable energies into the power grid. This transition towards renewable energy calls for the development of direct current (DC) electricity networks.

The platform is a crucial asset for this transition as it enables the validation of future high-voltage equipment in direct current as well as in alternating current and offers an extensive range of tests.

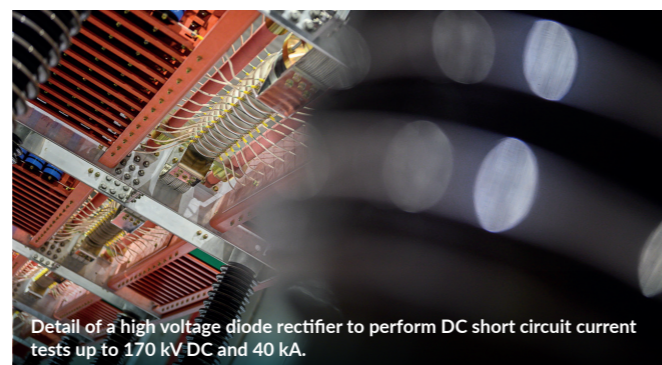
The High Power Source is a current source that can provide exceptionally high currents, in the range of a hundred kilo amperes, for extremely short periods. **"For a few tenths of a second to a few seconds, we can reproduce the power output of a power station,"** explains Christophe Creusot, the platform's Technical Manager at SuperGrid Institute.

### A facility without equal in Europe

While existing platforms only produce AC current, the High Power Source is capable of producing the real high voltage direct current that devices will encounter in the field. **"Our platform is the only one in Europe that generates direct current power, as found in the power grid. This is extremely important, as high voltage DC networks are the power grids of the future. This is a real competitive advantage for the research we are conducting on new DC circuit breakers,"** says Hubert de la Grandière, CEO of SuperGrid Institute.



The production of this DC current is made possible by the platform's current rectifier, which converts the current generated by an alternator into high-voltage direct current. SuperGrid Institute can therefore carry out tests on every type of protective equipment for electrical networks (circuit breakers, current limiters, etc.). **"Our platform is also able to carry out alternating current tests at different frequencies. It is this ability to perform both types of tests (DC and AC), and the wide range of possibilities that are consequently available, that makes it unique,"** adds Christophe Creusot.



Detail of a high voltage diode rectifier to perform DC short circuit current tests up to 170 kV DC and 40 kA.

## SUPERGRID INSTITUTE, AN INTERNATIONALLY RECOGNISED PLAYER

SuperGrid Institute is an Institute for Energy Transition and member of the French Institutes of Technology (FIT). The Institute is an important strategic project for France, at a time when the urgency of reducing the country's dependence on fossil fuels and reducing its greenhouse gas emissions is becoming ever more apparent. Its research topics mainly concern high and medium voltage direct current, subjects whose technological maturity is still in its infancy. However, by promoting the emergence of these technologies for future electricity networks and their flexibility, the company aims to provide solutions that will give France a competitive advantage in terms of industry, influence, attractiveness, employment, and research.



SuperGrid Institute's headquarters.

### An exceptional variety of tests

The platform is designed to carry out short-circuit tests on substation equipment at different frequencies: 50 Hz, 60 Hz, or even 16.667 Hz (for certain niche tests required in the railway industry for example) and up to 80 kA. When coupled with the generators of General Electric's CERDA test laboratory, which is located on a neighbouring site in Villeurbanne, the High Power Source will be able to perform tests at currents in the range of 140 kA.

**"The range of tests that we are capable of performing is already extensive, but if a customer comes to us tomorrow with a particularly specific request, we will examine how we can accommodate them on a case-by-case basis,"** says Christophe Creusot.



Control room.

### A growing reputation

Eight years after its creation, SuperGrid Institute boasts a prominence and reputation that goes beyond France's borders. The company has already gained genuine national and international recognition, based on its skills and the quality of its teams' work.

The success of the European projects SuperGrid Institute has submitted with various industrial partners stands as proof of its expertise. **"In 2022, we won six of the seven projects that we submitted to the European Commission. This confirms the relevance of our positioning and our skills. We are in the right place at the right time, working at the heart of electricity transmission operators' concerns,"** says Hubert de la Grandière.



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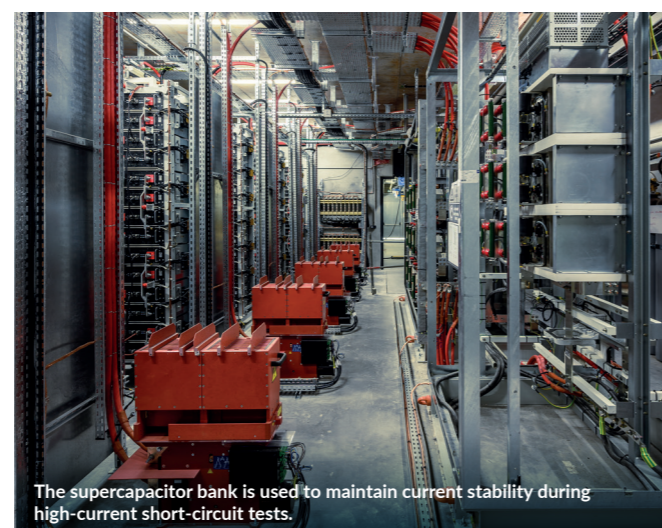
### An investment with a significant contribution from the Auvergne-Rhône-Alpes Region

Following its creation in 2014, SuperGrid Institute moved into its new premises in Villeurbanne in 2018, bringing the majority of its test platforms together under one roof. At the end of its initial ten-year-long investment period, the Institute will have received more than €220m in funding, thanks to the French Investments of the Future Programme (PIA, now "France 2030") and its shareholders. SuperGrid Institute has dedicated €45.9 million to this High Power Source project, a substantial investment that was endorsed by the Auvergne-Rhône-Alpes Region who contributed €10 million to the project.

As the leading producer of electricity and renewable energy in France, the Auvergne-Rhône-Alpes Region is highly aware of the necessity for power networks to evolve to be able to support the upcoming energy transition. By investing in this project, the Region is reiterating its desire to offer long-term support for research and innovation, particularly with regards to the collaborative work that SuperGrid Institute undertakes with regional universities and schools.

To be able to perform tests in the platform, an adjacent test hall with imposing characteristics needed to be built alongside the High Power Source. The hall measures 25 metres high with a floor surface area of 520 m<sup>2</sup>.

The basement level contains the various equipment required



The supercapacitor bank is used to maintain current stability during high-current short-circuit tests.

to cool the generator and the support needed to isolate the vibrations of the machine from the rest of the building; namely a reinforced concrete block weighing around 1,200 tonnes which is installed on springs.

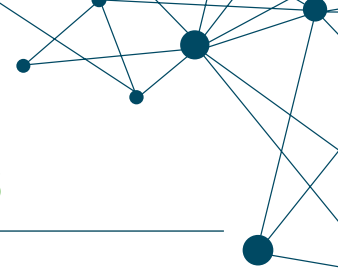
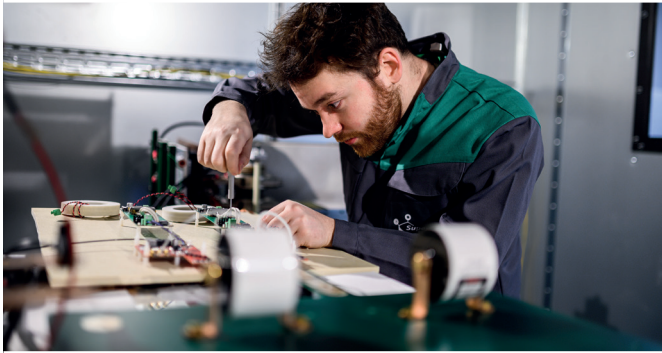
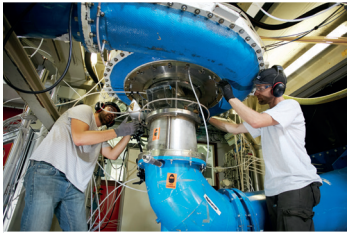
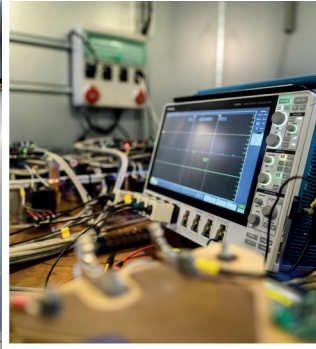
The ground floor of the platform contains the generator and various state-of-the-art auxiliary equipment used to operate and control the test current parameters (e.g. a supercapacitor bank). The first floor houses the power electronics equipment associated with the generator which is used to power it up and control its rotation speed, among other things, while the second floor houses the rectifier.

### Keeping up the momentum

SuperGrid Institute's CEO intends to maintain this momentum, convinced that successfully completing all the European projects the Institute has won so far will inevitably enable it to develop its skills and reputation even further, as much in DC networks, as in materials, cable diagnostics, converters, superconductivity, or the hybridisation of hydraulic power plants, and the list goes on.

The next few years should also see the final stages of development of the DC circuit breaker developed by the institute, whose performance has already been demonstrated in single modules. At the same time, SuperGrid Institute will continue to develop its work on DC medium voltage, which is currently an important area of diversification for the Institute. Finally, other high stakes projects are currently being launched, notably around the collection of solar energy.

**"Over the next five years, we need to consolidate our consulting services, as well as the new research partnerships that we have developed over the past three years. We also need to develop industrial partnerships to bring our technologies to the market: DC circuit breakers and switchgear, converters, connectors and switchgear for offshore wind,"** he concludes.



## KEY FIGURES

**12 M€** ANNUAL R&D BUDGET

**4.5 M€** TURNOVER IN 2022

**20** RESEARCH PLATFORMS

**140** EMPLOYEES  
AND MORE THAN 25 NATIONALITIES

OVER **90** PATENT APPLICATIONS

MORE THAN **60** PHD STUDENTS  
SINCE 2014

MORE THAN **315** INTERNATIONAL PUBLICATIONS

## ABOUT SUPERGRID INSTITUTE

SuperGrid Institute was created in 2014 by a consortium of fourteen shareholders from the electricity sector in France (industrialists, institutions & research and teaching organisations). As a centre specialising in research, testing and services for future electrical power transmission networks and technologies, SuperGrid Institute has received financial support from France's "Investments of the Future" programme, the Auvergne-Rhône-Alpes Region, and the City of Lyon. SuperGrid Institute brings together the complementary skills of engineers from the industrial world and academic researchers in a collaborative research environment, with 140 people of more than 25 nationalities. They work mainly on high and medium voltage direct current and the massive integration of renewable energy to ensure the stability and security of tomorrow's electricity network.

## GLOSSARY

AC : Alternating Current

DC : Direct Current

ITE : Institute for Energy Transition

## PRESS SERVICE

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